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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/832,220	04/11/2001	Yasuhiko Nara	29284/541	9834

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EXAMINER

BERMAN, JACK I

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 02/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant(s)

09/832,220

Applicant(s)

NARA ET AL.

Examiner

Jack I. Berman

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 9-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 9-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

Art Unit: 2881

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 5,578,821 to Meisberger et al. in view of U.S. Patent Number 6,259,960 to Inokuchi and U.S. Patent Number 6,263,099 to Maeda et al. for the reasons explained in the previous Office action. In the amendment filed on December 2, 2002, Applicants argue that the combination of references applied by the examiner do not teach to determine a pixel size on the basis of a size of the circuit pattern to be inspected. However, as was explained in the previous Office action, Inokuchi teaches to adjust the magnification of an image of a defect in an SEM inspection apparatus on the basis of the size of the circuit pattern to be inspected and Maeda et al. teaches that pixel size is related to image magnification. If the magnification is related to the circuit size and the pixel size is related to the magnification, then it follows that the pixel size would inherently be related to the circuit size. In other words, if a person having ordinary skill in the art applied the teaching of Inokuchi to the Meisberger et al. apparatus by adjusting the magnification of the display image on the basis of the circuit size, it would have been obvious to such a person to perform this adjustment by changing the pixel size, thereby inherently changing the size of the pixel on the basis of the size of the circuit.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meisberger et al. As has been explained, Meisberger et al. discloses an inspection apparatus for a circuit pattern comprising an irradiation apparatus (column 20) which uses lenses 95, 104, 125 to

Art Unit: 2881

direct a charged particle beam 100 onto the surface of a substrate 57 on which a circuit pattern has been formed, detectors 32 for detecting signals from the substrate, memory 52 for storing the signal visualized as an image, a comparing apparatus (defect processor 56) for comparing the stored signal to a signal generated by a different region of the substrate (Meisberger et al. calls such comparison a "die-to-die" comparison), and a monitor 46 which is capable of displaying any of the signals, including those generated by the defect processor. It would therefore have been obvious to a person having ordinary skill in the art to display either the SEM image produced while the circuit pattern is being irradiated (either before or after the defects have been classified by the defect processor because such classification would have absolutely no effect on the signal produced by the detector), the stored SEM image used as the basis of comparison to check for defects, or the SEM image of the defects extracted from the comparison by the defect processor 56. Since all three images are in the computer controlling the Meisberger et al. inspection apparatus, the choice of which image to display is a matter of routine operation. It would also have been obvious to a person having ordinary skill in the art to irradiate the circuit pattern again after the defect has been classified, i.e. examine the circuit pattern again with the SEM, because after this classification has occurred, such a person would probably want to study the defect to try to figure out how significant the defect was and how it was produced.

Claims 4, 5, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meisberger et al. in view of U.S. Patent Number 5,594,245 to Todokoro et al. and Inokuchi. Meisberger et al. teaches that in addition to a "die-to-die" comparison of different regions on the same substrate, the patented inspection system can also be used for a "die-to-database" inspection in which the image derived from the signals generated by the irradiation of a region

Art Unit: 2881

on the substrate is compared to an image transmitted from an external apparatus (the database). Meisberger et al. does not specify how the various image signals are displayed on the monitor 46, but Todokoro et al. teaches at line 46 in column 26 through line 4 in column 27 that different image signals, either from different types of detected signals or from the design information of the circuit pattern (which inherently constitutes a wafer map) may be combined by a graphic composer and displayed on a monitor in a superimposed (i.e. "overlapping") manner. It would have been obvious to a person having ordinary skill in the art to use the graphic composer disclosed by Todokoro et al. to display the different image signals described by Meisberger et al. because Meisberger et al. requires some type of means to process the various image signals for display but does not specify a particular means. The graphic composer disclosed by Todokoro et al. fills this gap. While Meisberger et al. uses only an SEM to inspect circuit patterns for defects, Inokuchi teaches, in the "BACKGROUND OF THE INVENTION", that it is known in the art to provide an optical apparatus to do a preliminary inspection for defects before the SEM is used. Since this method of using two types of apparatus would make the inspection process faster, because optical inspection does not require the scanning time that the SEM does and the SEM would not have to waste time scanning areas of the circuit pattern where there were no observed defects, it would have been obvious to a person having ordinary skill in the art to provide the Meisberger et al. SEM inspection system with the optical inspection apparatus disclosed by Inokuchi and to use the graphic composer disclosed by Todokoro et al., which, as is discussed above, can be used to combine different types of image signals, to combine the different image signals for display in an overlapping manner. Inokuchi also teaches, at lines 25-39 in column 19, that processing of the output from a defect image filing system can include adding comments. It

Art Unit: 2881

would therefore have been obvious to a person having ordinary skill in the art to include information about the defects displayed as such comments.

Claims 9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inokuchi in view of U.S. Patent Number 5,973,777 to Nomoto et al. As was stated in the previous Office action, Inokuchi discloses an inspection system for a circuit pattern comprising a preliminary inspection apparatus that inspects substrates and extracts defect information and transmits this information to a review SEM (an observing apparatus identical to that claimed in the instant application) that uses the coordinates of defects found by the preliminary inspection apparatus to observe these defects. At lines 36-58 in column 63, Inokuchi teaches to use alignment marks on the wafer to properly align it in the inspection apparatus. While Inokuchi uses alignment marks that are already formed on the wafer for this purpose and records the positions of defects relative to these known marks, Nomoto et al. teaches, at 3-8 in column 6, that such marks can be written on a substrate near a defect by the inspection apparatus when a defect is discovered. It would have been obvious to a person having ordinary skill in the art to use Nomoto et al.'s marking apparatus to provide the alignment marks required by Inokuchi. Applicant's arguments filed December 2, 2002 have been fully considered but they are not persuasive. Applicant argues that Nomoto et al. teaches to mark a specimen being inspected at a defect, not near a defect as is required by the claims of the instant application. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The fact that Nomoto et al. marks the specimen at the defect rather than near the defect is

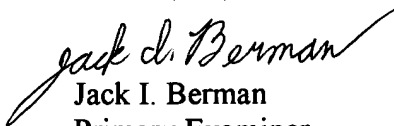
Art Unit: 2881

irrelevant because the rejection was based on the combination of Nomoto et al. with Inokuchi, not Nomoto et al. alone. It is this combination of references that would have taught a person having ordinary skill in the art to use the marking method taught by Nomoto et al. to mark a specimen near a defect in order to perform the alignment required by Inokuchi.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack I. Berman whose telephone number is (703) 308-4849. The examiner can normally be reached on M-F (8:30-6:00) with every second Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (703) 308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Jack I. Berman
Primary Examiner
Art Unit 2881

jb
February 19, 2003